REMARKS

The Office examined claims 1-18 and rejected same. With this paper, the claims are unchanged.

Rejections under 35 USC §102

At section 11 of the Office action, claims 1, 2, 9, 14 and 16-18 are rejected under 35 USC §102 as being anticipated by Wilson (U.S. Pub. 2001/0032269).

The independent claims are 1, 14, and 16-18.

Claim 1 is to a method including a step in which a sender transmits segments at a rate of transmission and increases the rate of transmission based on feedback the sender receives from the receiver, and also includes a step in which the sender receives a message including one or more bits set to convey an indication of low congestion, and a step in which, in response to the indication of low congestion, the sender increases the data transmission rate so as to achieve increased throughput. Thus, in the method recited in claim 1, the sender responds to feedback from the receiver provided by the receiver in the way of one or more bits set to convey an indication of low congestion, i.e. set to signal low congestion, and then, in response to receiving such feedback, increases the data transmission rate.

Applicant respectfully submits that in contrast Wilson teaches a system in which a sender sends a packet to a receiver and sometimes includes in the packet a marking "to indicate possible congestion" [first sentence of par. [0040]). More specifically, if the send buffer of the sender is e.g. 80% full, there would be an 80% chance that the next packet sent by the sender would be "marked." (See the first sentence of both par. [0039] and [0040], and also the third sentence of par. [0040].) The receiver than sends either an ACK (or in some embodiments a

NAK) signal back to the sender in response to receiving the packet (with or without errors), and if the packet included the marking to indicate possible congestion, the receiver simply copies the marking into the ACK/NAK signal and so echoes the marking. The marking, by itself, is neither an indication of either high or low congestion. The presence of the marking is merely an indication of at least some congestion. Wilson then teaches (at par. [0047] cited in the Office action) the sender *decreasing* throughput if it receives an ACK including such an echoed marking, but of course never increasing the rate of transmission in such an event. Wilson also teaches (also at par. [0047]) increasing the rate of transmission but only "[i]f none of the data packets were marked during a RTT [round trip time]." (Applicant notes that the second sentence of par. [0047] is:

> In one embodiment, the data transfer rate is *increased* immediately after marked data is detected, and the data transfer rate is increased after a full RTT has elapsed and no data was detected as being marked. [Emphasis added.]

But in the very next sentence, Wilson explains:

> Therefore, the increasing of the data transfer rate is typically gradual while the decreasing of the data transfer rate may be rapid.

Thus, "the data transfer rate is increased immediately after marked data is detected" is clearly a misstatement because it indicates a rapid increase, not a gradual one, and so should instead read "the data transfer rate is *decreased* immediately after marked data is detected." See also claim 1 of Wilson, which makes clear that the transmission rate is increased only in case of *unmarked* data. See also Fig. 4, which also shows increasing the data rate only in case of receiving unmarked data.

In response to the amendment of claim 1 (and the other independent claims), the Office now refers also to par. [0043] for a teaching of a "congestion control bit," but Wilson explains there only that "a congestion control bit may be set in the ACK

header to show that a particular data packet was marked," and thus the congestion control bit of Wilson is simply one way to mark a data packet but the marking is as described above, i.e. more likely or less likely depending on how full the send buffer is. The Office, however, asserts that the congestion control bit is "set to convey an indication of low congestion" on the basis that Wilson includes the language, in par. [0043], an "ACK marked with the data congestion information." But applicant respectfully submits that the recitation in Wilson of an "ACK marked with the data congestion information" at par. [0043] is made as part of the explanation by Wilson that:

> It should be appreciated that the ACK may be marked in any way which would show specific information regarding marked data packets. In one embodiment, if the data packet is marked, the receiving TCP host generates *an ACK marked with the data congestion information* *within the ACK header*. In another embodiment, a congestion control bit may be set in the ACK header to show that a particular data packet was marked. If the data packet is not marked, an unmarked ACK is generated. [Emphasis added.]

Thus, Wilson uses the phrase "ACK marked with the data congestion information" again only as part of a description of a way in which an ACK may be marked (in this case, in the ACK header). Applicant respectfully submits that it is clear from Wilson that the "data congestion information" is the marking (presumably some bit set in the ACK header by the receiver to signify the data packet was marked by the sender), which is as described above, i.e. a data packet is more or less likely to be marked by the sender, i.e. to include "data congestion information," depending on how full the send buffer is.

Applicant therefore respectfully submits that Wilson fails to teach the invention as in claim 1 in two respects: first, the marking included with an ACK (or NAK) does not, by itself indicate low congestion, whereas claim 1 recites the sender receiving a message including one or more bits set to convey an

indication of *low* congestion. A packet may include a marking if congestion (as measured by how full the send buffer is) is either high or low; it is just that it is more likely that a packet would include a marking if the congestion is high. But even if the buffer is only 10% full, on average 10% of the packets would include a marking, which would be echoed back by the receiver. It cannot therefore fairly be said that the marking indicates low (or even high) congestion.

Second, the only instance according to Wilson in which the rate of transmission is to be increased is in case of *not receiving (during a round trip time) any bits conveying any information about congestion*, in full and complete contrast to the sender increasing the data transmission rate so as to achieve increased throughput in response to the indication of low congestion, as recited in claim 1.

The same argument applies to claims 14 and 16. The portion of the argument in respect to transmitting a message including one or more bits set to convey an indication of low congestion applies also to claim 18.

Accordingly, applicant respectfully requests that the rejections under 35 USC §102 be reconsidered and withdrawn.

Rejections under 35 USC §103

At section 13 of the Office action, claims 3, 10-13 and 15 are rejected under 35 USC §103 as being unpatentable over Wilson in view of RFC 2001.

Regarding claim 3, the Office action relies on section 4 of RFC2001 to reject claim 3. Claim 3 recites that in the step (20c) in which the sender (30) increases the data transmission rate, the sender performs an accelerated start in which the sender sets a slow start threshold to a standard initial value and re-

initializes the congestion window value to a new predetermined value to achieve increased throughput, and then grows the congestion window at a predetermined rate in respect to received positive acknowledgments. Claim 3 depends from claim 2, which depends from claim 1, and therefore, the accelerated start recited in claim 3 is in response to a message including one or more bits set to convey an indication of *low* congestion.

The Office notes that RFC 2001 teaches re-initializing a congestion window value to an new predetermined value to achieve increased throughput in response to an indication of "moderate congestion," and asserts that moderate congestion is the same as *low* congestion (recited in claim 1, from which claim 3 depends). Applicant respectfully submits that low congestion is not moderate congestion, and is as opposed to moderate (or high) congestion. Claim 1 recites increasing the throughput in response to an indication of low congestion, which is accomplished according to claim 3 via the congestion window. In contrast, in case of moderate congestion, RFC 2001 teaches performing "congestion avoidance but not slow start"--i.e. the fast recovery algorithm--after fast retransmit sends what appears to be a missing segment, which (according to RFC 2001) "allows high throughput under moderate congestion." But at section 2, it is explained that "the loss of a packet [i.e. a missing segment] signals congestion somewhere in the network." (Second paragraph, section 2.) So RFC teaches the use of congestion avoidance but not slow start in case of "congestion," as opposed to "low congestion." There is therefore no teaching of increasing the rate of transmission according to the steps recited in claim 3, in response to receiving one or more bits set to convey an indication of low congestion.

The same argument applies to claim 15.

In addition, claims 3, 10-13 and 15 are believed allowable in view of their dependencies from claim 1 or from claim 14, believed allowable for the reasons given above.

At section 14 of the Office action, claims 4-8 are rejected under 35 USC §103 as being unpatentable over Wilson in view of Qaddoura (US 6,646,987).

Claims 4-8 depend from claim 1, believed allowable for the reasons given above.

Accordingly, applicant respectfully requests that the rejections under 35 USC §103 be reconsidered and withdrawn.

Conclusion

For all the foregoing reasons it is believed that all of the claims of the application are in condition for allowance and their passage to issue is earnestly solicited. Applicant's attorney urges the Examiner to call to discuss the present response if anything in the present response is unclear or unpersuasive.

Respectfully submitted,

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